



# BUILDING GREAT COALITION ENGINEERS

BY MAJOR TIMOTHY R. BECK

Today from the Royal Australian Engineers (RAE) School of Military Engineering (SME) at Steele Barracks, Moorebank, New South Wales, Australia. Like more than 20 United States Army engineer majors before me, I am the military personnel exchange program officer assigned to the United States Army Engineer School, attached to United States Army Pacific, and further attached to SME. By position, I am the officer commanding/senior instructor for the Engineer Tactics Wing, responsible for training engineer officers and combat engineer non-commissioned officers (NCOs). Officer training consists of three courses:

- Regimental Officers Basic Course (ROBC) for all new engineer officers coming into the RAE
- Engineer Operations Officers Course for junior captains
- Combat Officers Advanced Course for senior captains before promotion to major and company-level command

There are promotion-related courses for four NCO groups:

- Combat engineer corporals
- Combat engineer sergeants
- Engineer warrant officers (WOs)
- Combat engineer WOs

Australian Army NCO ranks are modeled after the British Army, in which corporals are equivalent to grades E-5 and E-6, sergeants to grade E-7, WO Class 2 to grade E-8, and WO Class 1 to grade E-9. The Engineer Tactics Wing also oversees the Assault Pioneer Officer/NCO Course for the Royal Australian Infantry, consisting of light infantry training on demolitions, breaching, and watermanship (small boat operations) to support infantry assaults. This article will briefly highlight the ROBC for 2010.

## Regimental Officers Basic Course

**R**OBC is almost 7 months long, the longest combat arms officer basic course in the Australian Army. A list of the topics covered by the course shows why:

- Operations
- Introduction to technical engineering
- Basic combat engineering (BCE)
- Geospatial engineering
- Search operations
- Demolitions
- Mine warfare
- Watermanship and bridging
- Force engineering

<b>Report Documentation Page</b>			Form Approved OMB No. 0704-0188	
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1. REPORT DATE <b>APR 2011</b>	2. REPORT TYPE	3. DATES COVERED <b>00-00-2011 to 00-00-2011</b>		
4. TITLE AND SUBTITLE <b>Building Great (Coalition) Engineers</b>		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Army Engineer School,Engineer Professional Bulletin,464 MANSCE Bldg 3201 Ste 2661,Fort Leonard Wood,MO,65473</b>		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>6</b>
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>	19a. NAME OF RESPONSIBLE PERSON	

- Force survivability, including chemical, biological, radiological, and nuclear detection (CBRND) and explosive ordnance disposal (EOD).

### Course Phases

**Operations.** The operations phase of ROBC gives the course a doctrinal foundation for topics such as offensive, defensive, and urban operations, emphasizing how engineers conduct and support them. Students learn how engineers conduct the individual military appreciation process to support engineer unit planning and provide engineer input for the staff military appreciation process, which is similar to the U.S. Army's military decisionmaking process. The operations phase is spread throughout the course, with topics covered by lectures and tactical exercises without troops (TEWTs).

**Technical Engineering.** This phase introduces officers without engineering degrees to the subject. Starting with a mathematics test (or "maths," as Australians say it) to determine their level of knowledge, students receive lessons on everything from basic algebra to the physics of structures. Introduction to building codes; case studies on construction projects; and practical exercises on construction

recons, structures, and concrete are all part of this phase. Students team up to build model bridges out of dry spaghetti and participate in bridge-loading competitions for bragging rights. As a bonus, one of the SME wings (training companies) got a decent concrete slab to use for a break area as part of the concrete practical exercise. While the "nontechs" are having fun, the officers with technical backgrounds conduct technical reconnaissance missions and design projects to be executed by other training courses.

**Basic Combat Engineering.** The course brings both sections of the course back together to learn ropes, knots, block and tackle, leverage, hand and power tools, and basic field fortifications. The RAE are responsible for water point operations, so students learn about water purification and conduct reconnaissance for water point operations. This is a very important mission, as seen during the Australian Army's disaster relief mission to Sumatra in 2009. Students enjoy getting out of the classroom and getting dirty during this phase of the course.

**Geospatial Engineering.** Back in the classroom, students get their introduction to geospatial engineering, or "Geo." The Geo phase is designed only to skim the surface



Students set up a troop harbor—or platoon field site—command post during a field exercise.



**Left:** ROBC students build a scaled-down nonequipment bridge during the course.

**Below:** The students destroy the bridge in a follow-on demolition mission.



of the subject and give instruction on surveying. Students conduct a practical survey exercise around the Steele Barracks grounds to familiarize themselves with survey equipment and recording practices and procedures.

**Search Operations.** Search training in the RAE has roots in the United Kingdom's Corps of Royal Engineers, as does our own Army's. It focuses on everything from basic systematic techniques for searching structures, buildings, areas, personnel, and vehicles to the use of specialized tools and explosives-detection dogs and proper evidence handling procedures. RAE troops (platoons) get search missions while deployed, to include high-risk search and route clearance with dismounted searches at designated vulnerable points along the route.

**Demolitions.** Arguably the most academically challenging phase, "dems" gives young officers training in theory, safety procedures, and calculations, concluding with a live demolitions range exercise and a demolition mission during their final field exercise. This phase gives in-depth background during the theory and calculation lessons, explaining how different explosives work. This provides more flexibility for mission accomplishment, since an RAE officer can draw upon explosives from Australia, the United States, United Kingdom, or New Zealand, and quickly determine how to achieve the required effect. This phase traditionally results in more retests than any other phase of the course.

**Mine Warfare.** Mine warfare training is important to Australian Army leaders since they stress training for *a war*, not *the war*—current operations, in other words. The ROBC students receive training on national policies concerning mines, reporting requirements, procedures for planning and emplacing mines, and reducing minefields.

This phase gives plenty of hands-on training in employing mine detectors and probing rods, culminating in a minefield breaching exercise at night.

**Watermanship and Bridging.** ROBC students historically love the watermanship and bridging phase of the course, which covers small-boat operations, water safety, engineer bridge reconnaissance, and planning and construction of military bridges, including medium girder and floating support bridges—our old ribbon bridge. This phase gives the students a mental and physical workout. Mentally, students must learn the calculations required for planning bridging operations. Physically, they must work in crews to emplace and remove several medium girder bridges—to include three 13-bay, double-story builds (double, link, and pier) and a 14-bay, double-story build on a restricted site with a reverse bank strip—during their final field exercise. This phase isn't all hard work. Small-boat and ferry operations (with Zodiac® inflatable boats and float bridge rafts) add a little fun to the course.

**Force Engineering.** The force engineering phase teaches nontechnical students the basics of construction



**Students learn the possible results of failure to search role players for CS grenades.**

to support force protection. Students go over basic construction design, planning, construction management, and horizontal construction—including testing procedures and hands-on heavy construction equipment demonstrations. The hands-on demonstration is a great concept, allowing students to “play” on equipment before arriving at their units. Lessons continue with force protection design, including blast and ballistic effects, risk mitigation, rough assessments of postblast damage, and the planning and construction of nonequipment bridges.

**Force Survivability.** This phase covers the topics of CBRND and EOD, both part of the engineer mission of the RAE. This phase is strictly an introduction to these topics for the new engineer officers. Engineers can attend full courses on CBRND and EOD following successful completion of ROBC. Currently, EOD is basically an additional duty or “second hat” engineers wear in the RAE. The combat engineer troop sergeant (platoon sergeant) may be the unit EOD technician, obliged to support a combat engineer troop and maintain individual proficiency in EOD operations. In 2011, the first EOD squadron, or company, will stand up to try out the concept of centralizing the EOD skill set.

The ROBC also includes TEWTs, field exercises, and range safety officer (RSO)/officer-in-charge (OIC) qualifications week.

**Tactical Exercises Without Troops.** While a lot of the training is delivered by classroom lecture, the use of

TEWTs and field exercises provides a method to reinforce learning and permit assessment of each student to determine competency. TEWTs cover engineer support for offensive, defensive, and urban operations. The defensive and urban operations TEWTs are favorites, because students get on the ground to finalize and brief their plans. The defensive TEWT has been conducted at the same hilltop farmhouse in Mittagong, New South Wales, for more than 30 years, giving students a commanding view over the engagement area they plan to defend. The urban operations TEWT takes the course out of the classroom and into the Holsworthy Barracks urban operations site.

**Field Exercises.** All of the course lessons and TEWTs help prepare students for their field exercises.

- *Exercise Coral.* This exercise provides a forward operating base environment where students live and run missions for two weeks. It gives them the opportunity for practical application of course topics in a low-intensity, nation-building setting. While not assessed for record, the ROBC students get feedback and guidance on their technical execution of engineer tasks and their tactical execution as leaders. This exercise was developed as part of past course feedback from instructors and students.

- *Exercise Kokoda.* This is the culminating exercise of the ROBC. Students deploy to the field for two weeks for practical application of course topics in a high-intensity environment and are assessed for record. Starting in a troop harbor—or platoon field site—in the Holsworthy



**ROBC students search a role player.**

Training Area, the class functions as a light engineer troop supporting a maneuver battalion. Students rotate leadership roles as troop commander, troop sergeant, reconnaissance officer, or as one of three section commanders (squad leaders). The students must build up their troop harbor while conducting missions ranging from forward landing strip denial to reserve bridge demolitions. By design, the exercise

keeps the students very busy. Opposing Force Soldiers become a great tool to reinforce good practices and highlight poor practices. The threat—and use—of chemical agents in the form of CS grenades kept students during the recent course on their toes and in their protective gear (which they appreciated, since most of the evenings were near freezing).

One of the most memorable missions was the reserve demolitions on Engineers Bridge—a uniquely designed Bailey bridge that is famous in the RAE, since every ROBC class conducts a reserve dems mission on it. One lucky student first gets to conduct a reconnaissance of the bridge, then plans the mission of emplacing demolitions to prepare the bridge as a reserve target. A different student acts as the troop commander to prepare the bridge. During the mission, students don rigging harnesses and climb onto the bridge while placing inert charges as planned by the recon officer. A “mortar attack” by the opposition was repelled, but CS gas lingered a long time that cold morning, and the smell was still in the air hours later. The students had to break down their troop harbor, to include removing protective obstacles and filling in the fighting positions they had called home for a week, and deploy to the urban operations site. There they had to search the area, occupy an abandoned building, plan and build a defense of it, and interact with people who were both for and against the Australian Army.

This final phase of the exercise was a real challenge for the students to accomplish their missions and protect themselves while working within the rules of engagement. At some points, students were confronted by dozens of role players and had to make split-second decisions. A well-placed CS grenade from a role player who hadn't been searched ended the course's barbecue lunch, before “final call” finally went out. The students had their ups and



**Engineers Bridge  
is wired with  
inert demolition  
charges.**



A group of ROBC students pose with their last medium girder bridge.

downs during the exercise, but it was clear they were learning, retaining, and improving throughout its length.

**Range Safety Officer/Officer in Charge.** SME helps RAE units with RSO and OIC qualifications by running a week of range qualifications at the end of the ROBC schedule. The Australian Army requires RSO and OIC personnel to qualify on a range, then to be certified to run that range as RSOs or OICs. This certification is permanently recorded and follows the officers for their careers. This allows students to leave ROBC and be certified to act as RSOs or OICs at certain ranges, regardless of what unit they are posted to. This range week greatly helps the RAE overall and reduces training costs.

### Conclusion

**U**pon completion of Exercise Kokoda, course members got to relax for 24 hours before going on to their specialty courses. Officers heading to combat engineer regiments were off to the Search Advisors Course; those heading to construction squadrons—to include

sister Service officers—and the foreign students, went to the Construction Commanders Course; the remaining two officers headed to the Geospatial Officers Basic Course. All of these courses run for three weeks and provide a critical qualification for new engineer officers. A number of them were assigned to units set to deploy to Afghanistan in a few short months.

Overseeing the ROBC class for the RAE was an unbelievable experience. The course included all of this year's new engineer officers from Australia, New Zealand, Brunei, and Vietnam. It also included the first-ever fully qualified East Timorese engineer officer. The impact of this exchange program is far reaching as former students from the Australian and U.S. Armies progress through their careers.

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